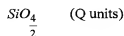
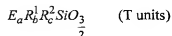
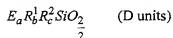
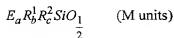


WHAT IS CLAIMED IS:

- 1                                    1.    A high weather and chemical resistant, addition-crosslinkable,  
2    epoxy-functional organopolysiloxane resin which contains at least one or more of the  
3    repeating units having the formulae:



- 4    wherein                    E is an epoxy-functional C<sub>1-18</sub> hydrocarbon group containing one or  
5    more oxygen atoms, provided that no oxygen atom is directly bonded  
6    to a Si- atom; and  
7    R<sup>1</sup> and R<sup>2</sup> are independently a C<sub>1-20</sub> hydrocarbon, optionally  
8    interspersed with a heteroatom linking group;  
9    a is an integer of 0, 1, or 2;  
10    b is an integer of 0, 1, 2 or 3;  
11    c is an integer of 0, 1, 2 or 3; and  
12    in M units, a+b+c=3,  
13    in D units, a+b+c=2,  
14    in T units, a+b+c=1,

15 wherein the M units are present in less than about 40 mole percent;  
16 the D units are present in an amount of up to about 40 mole percent;  
17 and  
18 the molecule, on average, contains at least two E components.

1 2. The resin of claim 1 wherein the hydrocarbon group of E  
2 comprises a C<sub>3-12</sub> hydrocarbon group.

1 3. The resin of claim 1 wherein the epoxy-functional  
2 organopolysiloxane resin has an alkoxy content of less than about 20 weight percent,  
3 based on the weight of the epoxy-functional organopolysiloxane resin.

1 4. The resin of claim 1 wherein the epoxy-functional  
2 organopolysiloxane resin has an epoxy equivalent weight in the range of about 150-  
3 1000.

1 5. The resin of claim 2 wherein the epoxy-functional  
2 organopolysiloxane resin has an epoxy equivalent weight in the range of about 200-  
3 600.

1 6. The resin of claim 5 wherein the epoxy-functional  
2 organopolysiloxane resin has a viscosity in the range of about 200-70,000 cps at  
3 25°C.

1 7. The resin of claim 6 wherein the E is glycidoxypropyl



1 8. The resin of claim 6 wherein the epoxy-functional  
2 organopolysiloxane resin comprises T units and the T units include structures

3 selected from the group consisting of silsequioxane and polysilsesquioxane  
4 structures.

1 9. The resin of claim 1 wherein the resin has a molecular weight  
2 between about 750 and 25,000.

1 10. The resin of claim 1 wherein the epoxy-functional  
2 organopolysiloxane resin is prepared by reacting a silicone resin with a silane having  
3 at least one epoxy group per molecule.

1 11. The resin of claim 10 wherein the silane is represented by the  
2 formula:



3 wherein each R<sup>5</sup> is individually selected from the group consisting of  
4 alkyl (C<sub>1-12</sub>), aryl (C<sub>6-9</sub>), vinyl, glycol, alkoxy (C<sub>1-12</sub>), and an epoxy functional C<sub>1-18</sub>  
5 hydrocarbon group of the formula R<sup>6</sup> - E<sup>1</sup> wherein E<sup>1</sup> comprises an epoxy group and  
6 R<sup>6</sup> comprises a C<sub>1-18</sub> hydrocarbon group optionally interspersed with at least one  
7 heteroatom linking group, with the proviso that at least one R<sup>5</sup> comprises R<sup>6</sup> - E<sup>1</sup>.

1 12. The resin of claim 11 wherein the heteroatom linking group,  
2 if present, is not adjacent to the E<sup>1</sup> group.

1 13. The resin of claim 11 wherein the hydrocarbon group of the  
2 R<sup>6</sup> comprises a C<sub>3-12</sub> hydrocarbon group.

1 14. The resin of claim 11 wherein the silane has a molecular  
2 weight in the range of about 100 to about 750.

1 15. The resin of claim 14 wherein the silane has an epoxy-  
2 functionality in the range of about 1 to about 4.

1 16. The resin of claim 15 wherein the silane has an alkoxy  
2 functionality in the range of about 1 to about 4.

1 17. The resin of claim 13 wherein R<sup>6</sup>-E<sup>1</sup> is glycidoxypropyl



1 18. The resin of claim 11 wherein the silane a γ-  
2 glycidoxypropylsilane having C<sub>1-12</sub> alkoxygroups.

1 19. The resin of claim 10 wherein the silicone has a molecular  
2 weight in the range of about 300 to about 15000.

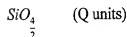
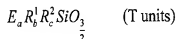
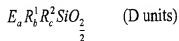
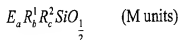
1 20. The resin of claim 7 wherein the resin comprises about 70  
2 mole percent T units and about 30 mole percent D Units.

1 21. The resin of claim 1 wherein the resin is a liquid and has a  
2 molecular weight of about 500-5,000.

1 22. The resin of claim 21 wherein the resin has a molecular weight  
2 of about 1,200.

1 23. The resin of claim 22 wherein the molecule contains at least  
2 three E components.

- 1                    24.    An epoxy-functional organopolysiloxane coating composition  
2 comprising:  
3                    a hardener;  
4                    an epoxy-functional organopolysiloxane resin which contains at least  
5 one or more of the repeating units having the formulae:



- 6        wherein        E is an epoxy-functional C<sub>1-18</sub> hydrocarbon group containing one or  
7        more oxygen atoms, provided that no oxygen atom is directly bonded  
8        to a Si- atom; and  
9        R<sup>1</sup> and R<sup>2</sup> are independently a C<sub>1-20</sub> hydrocarbon, optionally  
10       interspersed with a heteroatom linking group;  
11       a is an integer of 0, 1, or 2;  
12       b is an integer of 0, 1, 2 or 3;  
13       c is an integer of 0, 1, 2 or 3; and  
14       in M units, a+b+c=3,  
15       in D units, a+b+c=2,  
16       in T units, a+b+c=1,  
  
17       wherein       the M units are present in less than about 40 mole percent;  
18       the D units are present in an amount of up to about 40 mole percent;

- 19 with the proviso that the molecule, on average, contains at least two  
20 E components; and  
21 an acrylic resin;  
22 wherein the epoxy-functional organopolysiloxane resin is prepared by  
23 reacting a silicone resin with a silane represented by the formula:

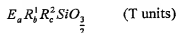
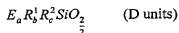
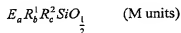


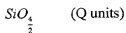
- 24 wherein R<sup>5</sup> are one of, or a combination of, the following groups alkyl (C<sub>1-12</sub>), aryl  
25 (C<sub>6-9</sub>), vinyl, glycol, alkoxy (C<sub>1-12</sub>), and an epoxy functional C<sub>1-18</sub> hydrocarbon group  
26 of the formula R<sup>6</sup> - E<sup>1</sup> wherein R<sup>6</sup> - E<sup>1</sup> comprises glycidoxypopyl



- 27 with the proviso that at least one R<sup>5</sup> comprises R<sup>6</sup> - E<sup>1</sup>.

- 1 25. An epoxy-functional organopolysiloxane coating composition  
2 comprising:  
3 a hardener;  
4 an epoxy-functional organopolysiloxane resin which contains at least  
5 one or more of the repeating units having the formulae:

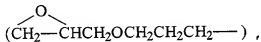




- 6 wherein E is an epoxy-functional  $\text{C}_{1-18}$  hydrocarbon group containing one or  
7 more oxygen atoms, provided that no oxygen atom is directly bonded  
8 to a Si- atom; and  
9  $\text{R}^1$  and  $\text{R}^2$  are independently a  $\text{C}_{1-20}$  hydrocarbon, optionally  
10 interspersed with a heteroatom linking group;  
11 a is an integer of 0, 1, or 2;  
12 b is an integer of 0, 1, 2 or 3;  
13 c is an integer of 0, 1, 2 or 3, preferably 0, 1, or 2; and  
14 in M units,  $a+b+c=3$ ,  
15 in D units,  $a+b+c=2$ ,  
16 in T units,  $a+b+c=1$ ,  
17 wherein the M units are present in less than about 40 mole percent;  
18 the D units are present in an amount up to about 40 mole percent; and  
19 with the proviso that the molecule, on average, contains at least two  
20 E components; and  
21 a flow additive;  
22 wherein the epoxy-functional organopolysiloxane resin is prepared by  
23 reacting a silicone resin with a silane represented by the formula:



- 24 wherein R<sup>5</sup> are one of, or a combination of, the following groups alkyl (C<sub>1-12</sub>), aryl  
25 (C<sub>6-9</sub>), vinyl, glycol, alkoxy (C<sub>1-12</sub>), and an epoxy functional C<sub>1-18</sub> hydrocarbon group  
26 of the formula R<sup>6</sup> - E<sup>1</sup> wherein R<sup>6</sup> - E<sup>1</sup> comprises glycidoxypopyl



- 27 with the proviso that at least one R<sup>5</sup> comprises R<sup>6</sup> - E<sup>1</sup>.